

CLAIMS

What is Claimed is:

1. An RFID transponder, comprising:

electronic circuitry to provide RFID functionality;

an energy storage device coupled to said electronic circuitry to provide an operational voltage thereto;

a battery operatively coupled to said energy storage device to provide a charge thereto; and

a rectified RF power source derived from an interrogating RF field operatively coupled to said energy storage device to provide a charge thereto, said rectified RF power source and said battery being electrically separated from each other;

wherein, said energy storage device remains charged by said battery in the absence of said RF interrogating field while said battery has remaining capacity, and said energy storage device is charged by the presence of said RF interrogating field after said battery has become depleted.

2. The RFID transponder of Claim 1, wherein said energy storage device further comprises a capacitor.

3. The RFID transponder of Claim 1, further comprising a first diode coupled between said rectified RF power source and said energy storage device.

4. The RFID transponder of Claim 3, further comprising a second diode coupled between said battery and said energy storage device.

5. The RFID transponder of Claim 1, wherein said rectified RF power source comprises an RF front end adapted to receive said interrogating RF field and provide a rectified voltage therefrom.

6. The RFID transponder of Claim 1, wherein said electronic circuitry further comprises a digital state machine adapted to control operation of said RFID transponder.

7. The RFID transponder of Claim 1, wherein said electronic circuitry further comprises an analog circuit block adapted to convert signals between analog and digital formats and to recover a clock signal from received analog signals.

8. The RFID transponder of Claim 1, wherein said electronic circuitry further comprises a memory device adapted to store data values.

9. The RFID transponder of Claim 7, wherein said memory device further comprises an electrically erasable, programmable read-only memory.

10. A method for powering an RFID transponder comprising electronic circuitry to provide RFID functionality and an energy storage device coupled to said electronic circuitry to provide an operational voltage thereto, said method comprising the steps of:

charging said energy storage device continuously from an internal battery while said battery has remaining capacity; and

charging said energy storage device passively from a rectified RF power source derived from an interrogating RF field after said battery has become depleted.

11. The method of Claim 10, wherein said energy storage device further comprises a capacitor.

12. The method of Claim 10, further comprising the step of electrically isolating said internal battery from said rectified RF power source.

13. An RFID transponder, comprising:

electronic circuitry to provide RFID functionality;

an energy storage device coupled to said electronic circuitry to provide an operational voltage thereto;

5 first means for charging said energy storage device from an internal power source of limited capacity; and

second means for charging said energy storage device passively from an interrogating RF field;

10 wherein, said energy storage device remains charged by said first means in the absence of said RF interrogating field while said internal power source has remaining capacity, and said energy storage device is charged by said second means in the presence of said RF interrogating field after said limited capacity of said internal power source has been reached.

15 14. The RFID transponder of Claim 13, wherein said energy storage device further comprises a capacitor.

16 15. The RFID transponder of Claim 13, wherein said first charging means further comprises a battery operatively coupled to said energy storage device through a first diode.

20 16. The RFID transponder of Claim 15, wherein said second charging means further comprises a rectified RF power source operatively coupled to said energy storage device through a second diode.